

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTOR(S): Eric Johnson, *et al*

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PATENT NO.: 5,907,335

GROUP:

ISSUED: May 25, 1999

EXAMINER:

TITLE: WET WIPING PRINTHEAD CLEANING SYSTEM USING A NON-CONTACT
TECHNIQUE FOR APPLYING A PRINTHEAD TREATMENT FLUID

May 17, 2001

PRELIMINARY REISSUE AMENDMENT

Attached is a copy of the printed patent, in double column format, each page on only one side of a single sheet of paper. The following amendments are respectfully requested:

IN THE CLAIMS:

1. (Amended) A method of servicing an inkjet printer printhead comprising [the steps of]:

[providing a wiper mounted for movement with respect to the inkjet printer printhead in wiping contact therewith to remove unwanted accumulation from the printhead;

providing a source of printhead servicing fluid;

providing another inkjet printhead as a non-contact servicing fluid applicator and orienting said applicator to jet servicing fluid in a reproducible quantity onto a surface of the printhead of said inkjet printer and the wiper;

transporting servicing fluid from said source to said applicator;]

jetting a reproducible quantity of servicing fluid from [said] an inkjet printhead used as a servicing fluid applicator through atmosphere onto at least one of the printhead of said inkjet printer and [the] a printhead wiper; [and]

[wiping] contacting the printhead of the inkjet printer [by moving] with the wiper during relative movement of the wiper [with respect to] and the printhead [of the inkjet printer] to remove unwanted accumulation therefrom;

[vaporizing said servicing fluid to jet ejectingly said fluid from said applicator printhead; and

said servicing fluid being projected from said applicator printhead onto the printhead and said wiper; and];

counting drops of servicing fluid ejected from said applicator [head]; and

controlling the amount of servicing fluid applied to the printhead based on the counted number of drops.

2. (Amended) The method of claim 1, further comprising [the steps of]:

maintaining [said] a source of servicing fluid in an uncontaminated state by preventing contact between said source of servicing fluid and said wiper.

3. (Amended) A method of [servicing] applying servicing fluid to a printhead of an inkjet [printer] printing mechanism comprising [the steps of]:

[providing a wiper mounted for movement with respect to the printhead to facilitate

removing unwanted accumulations from the printhead;

providing a source of printhead servicing fluid;

providing a non-contact applicator and orienting said applicator to project servicing fluid in a reproducible quantity onto a surface of at least one element selected from a group consisting of two elements, the printhead and the wiper through surrounding atmosphere;]

transporting servicing fluid from [said] a source to [said] a non-contact applicator;

projecting the servicing fluid through the atmosphere from said applicator onto [said] at least one [element] of said printhead and a printhead wiper; and

wiping the printhead [by moving the wiper with respect to the] during relative movement of said wiper and printhead to remove unwanted accumulations from the printhead, [said non-contact applicator comprising a spring; and] said servicing fluid being projected by[:] deforming [said] a resilient applicator spring[;] and releasing said applicator spring to project servicing fluid from said spring onto said printhead by rebound of said spring.

4. A system for servicing an inkjet printer having a printhead reciprocally moved by a carriage and a wiper positioned to move with respect to the printhead in wiping contact therewith to remove unwanted accumulations, comprising:

a source of printhead servicing fluid;

a servicing fluid applicator for projecting servicing fluid through the atmosphere onto the printhead and wiper; and

means for transferring servicing fluid from said source of servicing fluid to said applicator,

wherein said applicator comprises an elastically deformable spring for impelling treatment fluid toward at least one of the printhead and wiper.

5. (Amended) A system according to claim [4] 16, wherein said applicator is oriented to project a precisely controllable amount of servicing fluid through atmosphere onto a selected area on the printhead of said inkjet printer and said wiper; and wherein

said means for transferring servicing fluid includes:

control means for counting drops of servicing fluid propelled from said applicator to help facilitate controlling the amount of servicing fluid applied to the inkjet printer printhead based on the counted number of drops.

6. (Amended) The system of claim [4] 5, wherein said applicator [head includes] is a thermal inkjet head in fluid communication with said source.

7. The system of claim 6 , further comprising a counter coupled to said applicator head for counting drops of servicing fluid ejected therefrom to control the amount of servicing fluid applied to said carriage mounted printhead.

8. (Amended) The system of claim 4, wherein said spring is cantilever-mounted [and positioned to throw treatment onto said at least one element].

9. (Amended) The system of claim 8, further comprising a transfer wiper for placing servicing fluid from said source onto said spring by wiping contact, said transfer wiper being positioned to elastically bend said spring away from said [at least one] printhead [and wiper element] and then release said spring.

Cancel claim 10.

11. (Amended) A system according to claim [10] 16, wherein said [cartridge] applicator is a refillable cartridge.

12. (Amended) A system according to claim [10] 11, wherein said applicator [head] is a thermal fluid jetting printhead.

13. (Amended) A system according to claim [10] 11, wherein said applicator [head] is a piezo-electric fluid jetting printhead.

14. A method of servicing a portion of printhead of an inkjet printer comprising the steps of:

providing a wiper mounted for movement with respect to the printhead in wiping contact therewith to remove unwanted accumulation from a portion of the printhead;

providing a source of printhead servicing fluid;

providing another inkjet printhead as a non-contact servicing fluid applicator and orienting said applicator to jet servicing fluid in a reproducible quantity onto a surface of the printhead of said inkjet printer and the wiper;

transporting servicing fluid from said source to said applicator;

jetting servicing fluid from said applicator through atmosphere onto the printhead of said inkjet printer and the wiper; and

wiping the printhead of the inkjet printer by moving the wiper with respect to the printhead to remove unwanted accumulation therefrom; and

further comprising the steps of:

vaporizing said servicing fluid to jet ejectingly said fluid from said applicator printhead;

and

said servicing fluid being projected from said applicator printhead onto the printhead and said wiper.

Add the following new claims:

15. (New) A method of servicing a printhead of an inkjet printing mechanism comprising:

using another printhead to project a reproducible quantity of servicing fluid through atmosphere onto said printhead of said inkjet printing mechanism; and

wiping the printhead of the inkjet printing mechanism during relative movement of the wiper and printhead to remove unwanted accumulation therefrom.

16. (New) The method of claim 15, comprising thermally projecting said servicing fluid.

17. (New) The method of claim 15, comprising piezo-electrically projecting said servicing fluid.

18. (New) A system for servicing a printer having a carriage mounted inkjet printhead on a reciprocally movable carriage and a wiper positioned to wipe the carriage mounted printhead to remove unwanted accumulations from the printhead, a source of printhead servicing fluid, a non-contact service fluid applicator in fluid communication with said source, said non-

contact applicator comprising a second inkjet printhead oriented to eject servicing fluid in a reproducible quantity onto a surface of said carriage mounted printhead.

19. (New) A method of servicing a portion of a scanning printhead of an inkjet printer which includes a printhead wiper comprising:

projecting a reproducible quantity of servicing fluid from an applicator pump through the atmosphere onto at least one of said printhead and said wiper; and

wiping said printhead by moving said wiper with respect to said printhead to remove unwanted accumulations from said printhead.

20. (New) The method of claim 19, further comprising maintaining a source of servicing fluid in an uncontaminated state by preventing contact of said applicator with said printhead and said wiper.

21. (New) A system for servicing a portion of a printhead of an inkjet printer having a printhead reciprocally moved by a carriage and a wiper positioned and adapted to move with respect to the printhead in wiping contact therewith to remove unwanted accumulations from a portion of the printhead, comprising:

a source of printhead servicing fluid;

a servicing fluid applicator comprising a pump having an outlet for projecting a reproducible quantity of servicing fluid through the atmosphere onto at least one of said printhead and said wiper; and

means for transferring servicing fluid from said source of servicing fluid to said servicing

fluid applicator.

22. (New) The system of claim 21, wherein said applicator projects a metered amount of servicing fluid applied onto at least one of said wiper and said printhead.

23. (New) The system of claim 22, wherein said pump is a low volume spray pump.

24. (New) The system of claim 21, wherein said source of servicing fluid comprises a collapsible reservoir.

IN THE DRAWINGS:

Red marked prints of Figs. 36, 37, 38 and 40 are enclosed showing minor corrections to be entered.

REMARKS

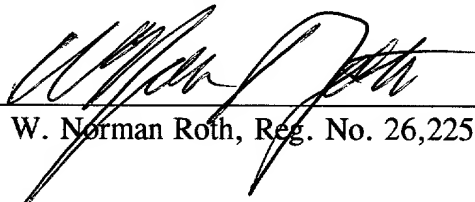
The status of all claims as of the date of this amendment and an explanation of the support in the disclosure of the patent for the changes made to the claims is attached.

A telephone call will be appreciated if questions remain.

Respectfully submitted,

Hewlett-Packard Company

by



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STATEMENT OF STATUS OF CLAIMS AND EXPLANATION OF SUPPORT FOR CLAIM
CHANGES - U.S. Pat. 5,907,335

As of the date of this amendment all of pending claims 1-14 presently appear in the patent. The claims have been amended for clarification of the language of the issued patent claims and support for the changes is generally found in the original unamended text of the claims themselves.

Independent method claims 1 and 3, respectively directed to use of a printhead as a service fluid applicator and use of a spring as a service fluid applicator, have been amended to eliminate "providing" steps and recite only essential method steps.

System claim 5 has been amended to depend from new claim 16 which uses a printhead as a service fluid applicator.

Claim 10 has been cancelled with consequent amendment of the back reference of claims 11-13..

New claim 15 substantially corresponds to claim 27 of application Serial No. 08/747,883 which was allowed but did not appear in the issued patent. New claims 15 - 16 in method and system format respectively, are directed to use of an inkjet printhead as the means for projecting treatment fluid through the air.

New method and system claims 17 - 22 are directed to the embodiment of Fig. 36.

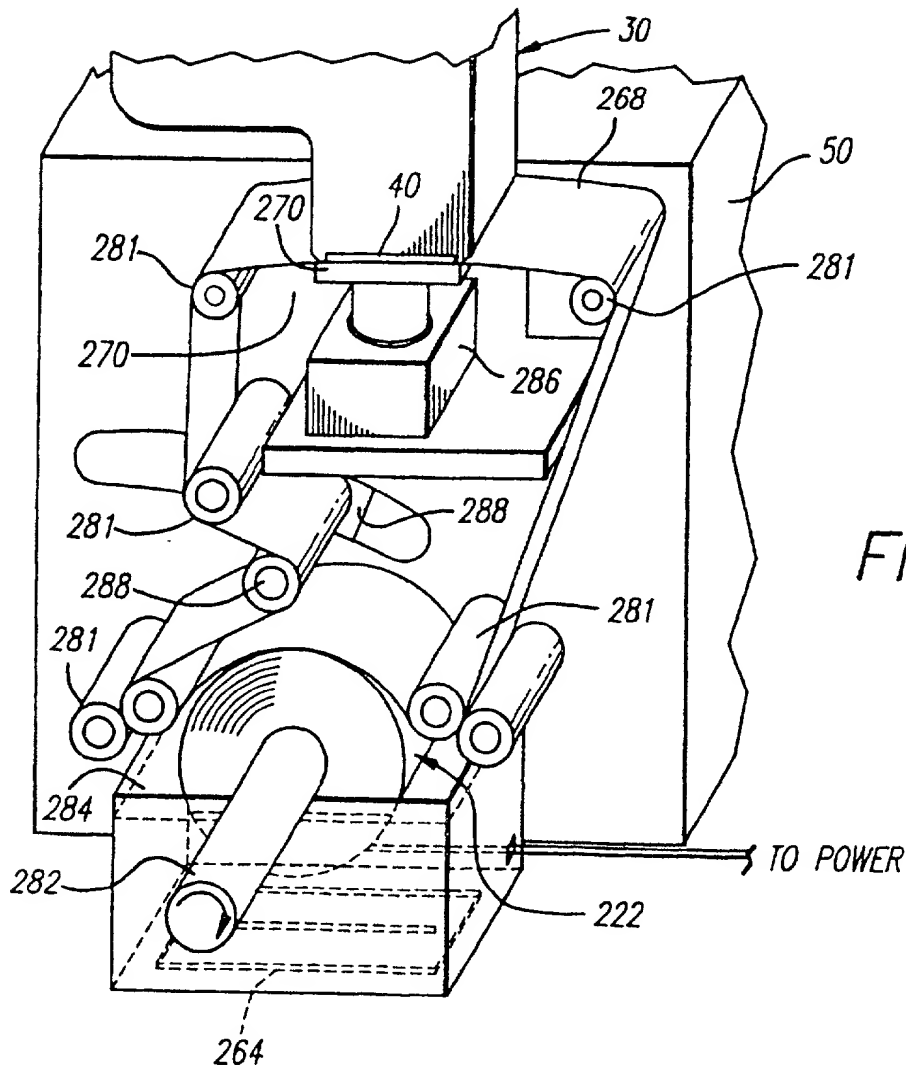


FIG. 35

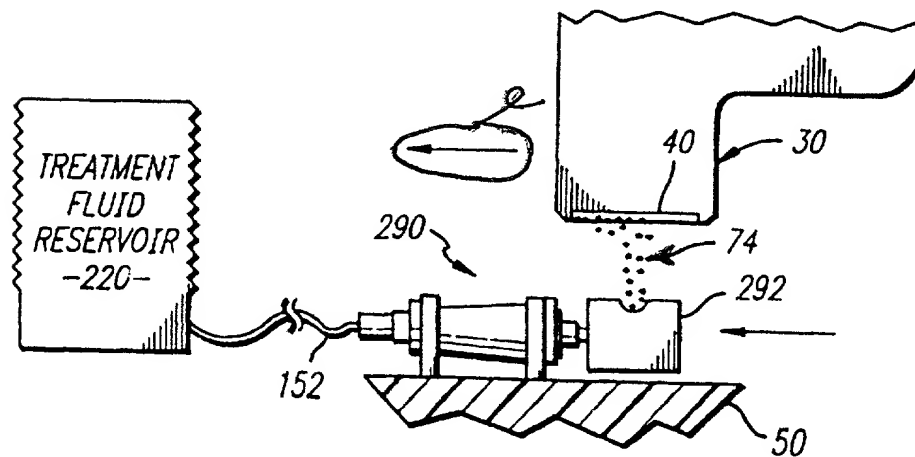


FIG. 36

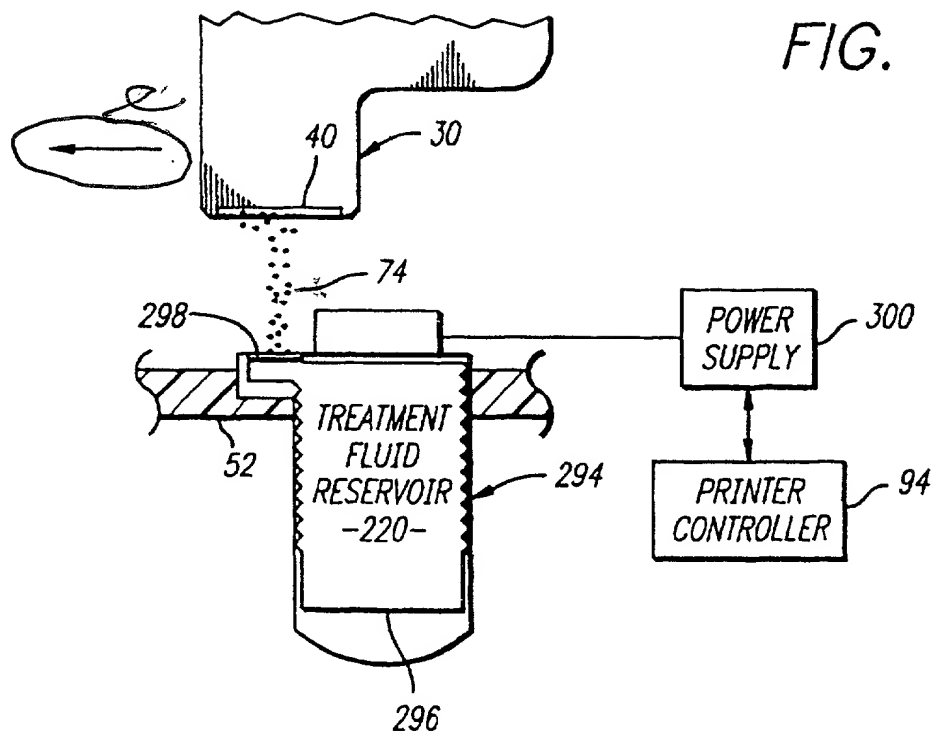


FIG. 38

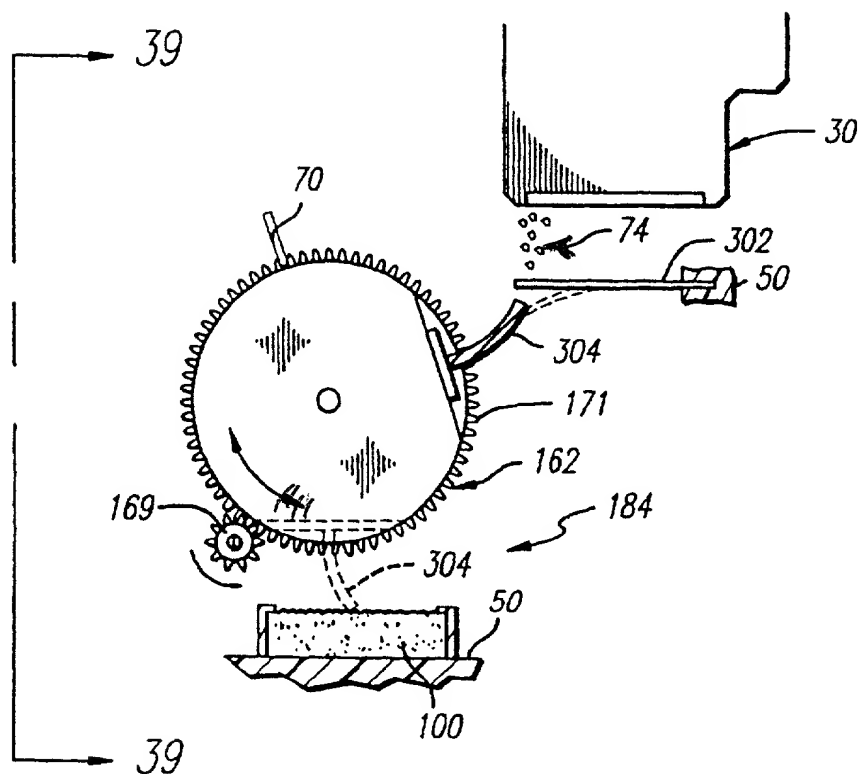


FIG. 39

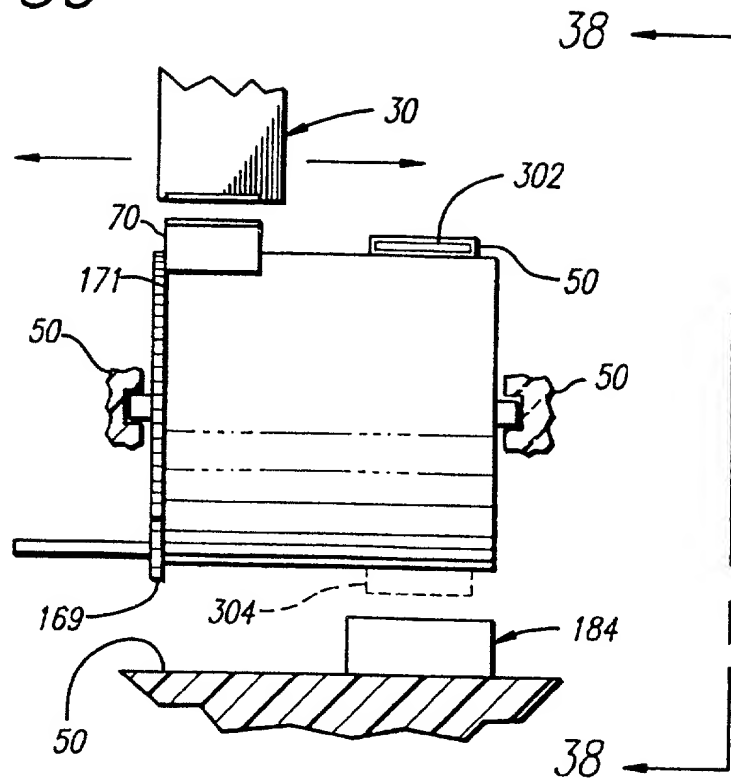


FIG. 40

